Journal of Forensic and Legal Medicine 20 (2013) 1108–1111

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/locate/jflm

Original communication

Assessment of knowledge about, attitudes toward, and awareness of a forensic medicine course among medical students at the University of Dammam

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ARTICLE INFO

Article history:
Received 23 April 2013
Received in revised form
26 August 2013
Accepted 13 October 2013
Available online 21 October 2013

Keywords:
Undergraduate
Autopsy
Forensic
Dammam

ABSTRACT

Aim: This study assesses the knowledge about, awareness of, and attitudes toward forensic medicine and the forensic medicine undergraduate course among medical students at the University of Dammam in Dammam, Saudi Arabia.
Method: We conducted a cross-sectional study of 143 fourth-year students. We used a structured, self-administered questionnaire containing 10 items relating to forensic medicine to assess the knowledge about, awareness of, and attitudes toward forensic medicine and the forensic medicine undergraduate course.
Results: The results showed inadequate knowledge about, poor attitudes toward, and limited awareness of the importance of the forensic medicine course among medical students. Media had an effect on the students as they are a major source of forensic science information among medical students.
Conclusion: The forensic medicine undergraduate course is important for medical students. We recommended that it be taught at the undergraduate level because it is the only academic source for forensic medicine that physicians may encounter in their careers. Teaching how to conduct an autopsy is important and has a positive role in medical education, and the forensic medicine curriculum must include instruction on autopsies, both from theoretical and practical perspectives. Medical institutes must take responsibility to increase awareness about the effect of media on medical education.

1. Introduction

Forensic medicine is a challenging and hidden branch of medicine that applies medical knowledge to the field of justice. Forensic medicine does not consist only of medico-legal autopsies and forensic pathology, but it is also an applied medical science and clinical forensic medicine such as dealing with rape cases and domestic violence.[1] Forensic medicine is an important part of medical education at the undergraduate level.[2] Nowadays, the teaching of a forensic medicine course has become compulsory at medical facilities.[3] Teaching forensic medicine to undergraduate effectively improve student's knowledge and attitudes.[4]

The forensic medicine course at the University of Dammam is taught to fourth-year medical students for a single semester during the second semester. The goal of teaching forensic medicine at the University of Dammam is to produce physicians who are knowledgeable about the medico-legal responsibilities in the practice of medicine.[5]

The pre-course questionnaire was not intended to be a test but rather an assessment of what the participants, individually and as a group, knew about the course topics. Initial assessment of general knowledge and skills related to the course is part of the learning measurement tools. In addition, this assessment aids the instructor during the course and with curriculum modification.[6]

Different sources of information students can receive about forensic medicine include either scientific materials such as other university courses (e.g., a pathology course) or unscientific sources, which have many misconceptions. Both the number and popularity of forensic science shows in the media have increased worldwide. Knowing these facts and understanding the backgrounds of the students will help both the instructor and the students during the course.[6–8]

The aim of this study is to assess knowledge about, awareness of, and attitudes toward forensic medicine and the forensic medicine undergraduate course among medical students at the University of Dammam in Dammam, Saudi Arabia. We carried out this assessment before course began so we could adjust and modify the curriculum to meet the course objectives while considering the

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http://dx.doi.org/10.1016/j.jflm.2013.10.003

students' backgrounds, and it will be used to compare student attitudes after the course to assess any changes.

2. Methodology

We conducted a cross-sectional study in January 2013 at the University of Dammam Medical College; the study was comprised of all fourth-year students who had not yet started the forensic medicine course, 143 students in total. We used a structured, self-administered questionnaire containing 10 items relating to forensic medicine to assess knowledge about, awareness of, and attitudes toward forensic medicine and the course. The questionnaire was devised and pre-tested. The questionnaire was given before the first lecture began. Those who were on leave, refused to participate, and those who were not available were excluded from the study. Oral informed consent was taken from each respondent. The study ethically approved by the university authority & Institutional Review Board. Confidentiality was maintained. An analysis was carried out by categorizing the questions into "yes," "no," and "I don't know" answers and one multiple choice question (Table 1).

3. Result

Out of a total of 172 fourth-years students, 143 students responded, 29 students were absent and did not participate. All questionnaires were completed fully, with no missing or unanswered questions. Out of these 143 students, 57 (39.86%) were male and 86 (60.13%) were female. Table 2 and Table 3 display the summary of student responses.

"An autopsy is an examination of a dead body" is a true statement. It was answered correctly by 130 students (90.9%); 11 students answered it incorrectly; only 2 students said, "I don't know."

For the second question, "The autopsy is mainly used to determine the cause of death," 105 students (73.4%) answered correctly ("yes"), while 14 (9.8%) answered incorrectly ("no"), and 24 students answered, "I don't know."

"Most cases seen by forensic physicians are rape cases" is a false statement; 57 students (39%) answered it correctly, 12 students (8.4%) incorrectly answered "yes," and 74 students (51.7%) answered, "I don't know."

Sixty-nine students (48.3%) thought that forensic physicians can determine the time of death very accurately; 37 students (25.9%) answered correctly by choosing "no" for this statement, while 37 (25.9%) responded, "I don't know."

Table 1
The questionnaire questions.

Question number	The question formula
Q1	An autopsy is an examination of a dead body.
Q2	A postmortem internal examination (dissection of a dead body) is conducted mainly to determine the cause of death.
Q3	Most of the cases seen by forensic physicians are rape cases.
Q4	A forensic physician can usually determine the time of death very accurately.
Q5	Do you consider forensic medicine an area in which you might want to specialize?
Q6	Forensic medicine is a branch of pathology.
Q7	A forensic physician deals only with confirmed and suspected homicide victims.
Q8	Do you think this course will help you in your career?
Q9	Did you receive any review of this course from an older student?
Q10 (MCQ)	Your major source of forensic medicine information before this course was:

Table 2
Number and percentage of answers for questions 1–9.

Question	Correct answer No. (%)	Wrong answer No. (%)	don't know No. (%)
Q1	130 (90.9%)	11(7.7%)	2 (1.4%)
Q2	105 (73.4%)	14 (9.8%)	24 (16.8%)
Q3	57 (39%)	12(8.4%)	74 (51.7%)
Q4	37(25.9%)	69 (48.3%)	37 (25.9%)
Q5	115 (80.4%) consider forensic medicine as future career	6 (4.2%) not consider forensic medicine as future career	22 (15.4%)
Q6	15 (10.5%)	76 (53.1%)	52 (36.4%)
Q7	3 (2.1%)	131(91.6%)	9 (6.3%)
Q8	33 (23.1%) thought that this course would help them in their careers	109 (76.2%) thought that this course would not help them in their careers	1 (0.7%)
Q9	37 (25.9%) they received a review for the course from an older student	63 (44.1%) did not received a review for the course	43 (30.1%) not sure about

There were 115 students (80.4%) who considered forensic medicine an area in which they might want to specialize; only 6 students (4.2%) did not consider forensic medicine as a future specialty, and 22 students (15.4%) did not know.

Only 15 students (10.5%) agreed that forensic medicine is a branch of pathology, 76 students (53.1%) believed that forensic medicine is not a branch of pathology, and 52 students (36.4%) responded that they did not know.

The statement for question 7, "A forensic physician deals only with confirmed and suspected homicide victims," is false. Some 131 students (91.6%) incorrectly said it was true, only 3 students (2.1%) answered correctly, and 9 (6.3%) responded that they did not know.

Only 33 students (23.1%) thought that this course would help them in their careers, whereas 109 students (76.2%) thought that it would not, and 1 student said, "I don't know."

Thirty-seven students (25.9%) responded that they received a review for the course from an older student, while 63 students (44.1%) said they did not, and 43 students (30.1%) said that they did not know. This means that they either did not remember or were not sure if they had received any reviews about the course.

Question number 10, which is the only multiple-choice question, asks about the student's main source of information on forensic medical sciences. Major sources of information were TV and media, 105 (73.4%); the Internet, 14 students (9.8%); relatives and friends, 13 students (9.1%); scientific books, 8 students (5.6%); and magazines and newspapers, 3 students (2.1%).

4. Discussion

Education about forensic medicine is important at the undergraduate level.[1] Autopsy is an important part of teaching forensic medicine. Medical educators still believe that the autopsy has value in medical education. Autopsy is sometime taught within the pathology curriculum, although many students remain poorly

Table 3
Number and percentage of answers for question No. 10.

Q10 Source of information	No.	%
Scientific books	8	5.6%
Internet	14	9.8%
Magazines & newspapers	3	2.1%
TV and media	105	73.4%
Relatives & friends	13	9.1%

educated about autopsies.[9] The presence of forensic medicine courses can help improve pathology curricula by teaching autopsy.[7,9]

Students involved in this study have studied pathology, which is why a high percentage can define the meaning of autopsy, but a lesser percentage knows about the objectives of autopsy. A high percentage of students participating in this study believed that the main objective of an autopsy is to determine cause of death. In a previous study about the misconceptions related to autopsies among the public, almost all respondents thought that autopsies were needed to find out why people died.10 However, people's understanding of the facts of autopsies is incomplete and often inaccurate. Medical students should know the appropriate facts about autopsies. It is unacceptable that some medical students and doctors know little about autopsies and their uses.[11]

More than half of the students involved did not know the nature and duties of forensic physicians. Most of students did not know the most frequent cases with which forensic physicians deal. This may be due to different roles and different systems in different countries, such as the presence of a forensic clinical examiner and a forensic pathologist.[12] In Saudi Arabia, the tasks of a forensic physician include autopsy, the clinical forensic medical examination of sexual assault cases, and examination of those injured in civil and criminal cases.[13]

Other parts of forensic medicine such as rape and domestic violence are important parts in undergraduate medical curriculum and any physician may encounter such cases in his career.[4]

Estimation of the time of death is a practical duty in daily forensic practice. Postmortem change is the main parameter used to estimate the time of death; almost all postmortem changes are influenced by several factors. These factors affect the accuracy of the estimation. The body of literature, especially on chemical methods of estimating the time of death, is continually growing.[27]

However, most of these methods do not meet the demands in practice. To date, no precise method is available.[14] Unfortunately, most physicians did not recognize this fact, and it is confirmed by the results of this study.

A high percentage of students considered forensic medicine as a future career even before gaining any experience in the field, but this percentage could change after the course. Choosing a specialty is a difficult decision for medical students. Medicine has more options for its practitioners than any other profession, and it provides numerous points from which to assess the choice of specialty. The decision to choose a particular area of medicine is affected by multiple factors including experience as a medical student, level of performance in a particular specialty area, values, gender, and interests.

Studies have shown the effect learning style has on medical students' choice of a specialty.[15,16] This is why we expect a change in this percentage after students experience this course. We must consider the effect of media on forensic medicine; the media have focused on the work of forensic practitioners, and this leads to interest in the specialty.

The surprising result of this study is that it showed a very high percentage of students either believe that forensic medicine is not a branch of pathology or do not know the relationship between forensic medicine and pathology. We can correlate this through the result of the question that asked the students if they would choose forensic medicine as a future career. Although pathology is one of the least popular specialties chosen by medical students, this study showed a different result, as forensic medicine was considered an independent specialty. Previous studies showed the most common reason clinical residents did not choose pathology—mentioned by 75% of clinical respondents—was that they preferred having direct patient contact.[17] Thus, students may not consider forensic medicine as having a clinical role. Another reason why residents do not choose pathology is that it may seem boring or repetitive as opposed to forensic medicine, which is a hidden part of medicine for medical students. Student link pathology with histology, and they do not enjoy histology. Among clinicians and the public, pathology has low prestige and a poor reputation. All these reasons may not apply to forensic medicine, and that is why a high percentage of students think differently about forensic medicine. Nevertheless, this high percentage may change by the end of the course.[17]

More than 75% of the participating students believed that this course would not help them in their careers as physicians. Forensic medicine is still less popular among medical students and graduates. In another study, the opinions of 600 randomly selected doctors on what should be taught to undergraduates in their clinical years were analyzed. The respondents gave a high priority to general medicine, pediatrics, general surgery, casualty, and gynecology, but a low priority to forensic medicine, plastic surgery, radiotherapy, anesthesiology, radiology, and rehabilitation medicine. Doctors thought that these should be taught to postgraduates.[18]

Forensic medicine was regarded as a superfluous luxury in the medical curriculum because there is a lack of literature that proves the importance and relation of teaching forensic medicine to the quality of practice.[16] However, recent study proved that effective teaching of clinical forensic medicine aspects could lead to improve student's knowledge, alter their awareness, and improve their attitudes towards their patients.[4]

Different studies examined some important issues related to the practice, such as medical ethics and malpractice.[19] Other papers reviewed the important relationship of forensic medicine to different fields; for example, the practice of emergency medicine and clinical forensic medicine have much in common.[20]

More studies mentioned the roles of autopsies in medical education. Some of these roles include training for uncertainty and understanding the correlation of clinical-pathological aspects.[22] Previous studies have shown that the students identified the post-mortem external examination as an important learning objective in undergraduate medical education. After the forensic medicine course, more than 70% of the students felt that they were able to perform an external examination and fill out a death certificate.[24,25] However, very few studies are able to convincingly assess the actual impact of autopsies on current medical practice.[21] It seems that clinicians do not view the autopsy as a particularly valuable tool for the assessment of patient care.[23]

Social media provide another challenge. The effect of TV and media as sources of information in the forensic sciences is clear in this study. In medical education, students usually struggle to distinguish between personal and professional boundaries. Studies have shown that social media involve communication through words, images, and multimedia, but they have implications in medical education.[26] Media are a primary tool for learning, especially for the public, but this must not be the case for the professional. Easier than changing the material within media is to differentiate between unprofessional and professional or academic material by medical students.[10] Previous research demonstrates that delivery of forensic medicine education at undergraduate level is effective to prompting visions of students in sexual violence, so the solution to prevent such inaccurate believes and myth is delivering of high quality education in forensic medicine to undergraduate.[4]

5. Conclusion & recommendations

The results of this study and the corresponding studies lead us to conclude and recommend the following points:

- The teaching of the forensic medicine course should become compulsory at medical schools; all medical institutes must teach forensic medicine at the undergraduate level, as it may be the only source of important information the physician may encounter during his or her career.
- The teaching of autopsies is important and has a positive role in medical education. The forensic medicine curriculum must include the teaching of autopsies, including both theoretical and practical aspects.
- When preparing courses in forensic medicine, attention should be paid to materials and methods of learning. This is an extremely important part of the informal curriculum, and it is the faculty's responsibility to correct and challenge specific misconceptions.
- Medical institutes must take responsibility for increasing awareness of the effect of media on medical education.
- We recommend further studies to evaluate role and direct effect of undergraduate forensic medicine courses on students and on the quality of practice.

Ethical approval

None.

Funding

None.

Conflict of interest

The author declare that they have no conflict of interest.

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